ENERGY STAR for Homes:
Guide for Modular Home Manufacturers

CONTENTS

INTRODUCTION

This Guide was developed for the modular housing industry and provides information necessary to manufacture and install homes under the ENERGY STAR program.

WHAT IS ENERGY STAR?

ENERGY STAR is a nationally recognized, voluntary labeling program to identify and promote energy efficient products to consumers and business owners across the United States. Initiated by the U.S. Environmental Protection Agency (EPA) in 1992, ENERGY STAR is now a joint effort of EPA and the U.S. Department of Energy, with each agency taking responsibility for promoting the ENERGY STAR label in particular product categories. The EPA is responsible for administering ENERGY STAR labeled homes.

Money Isn't All You're Saving

WHAT IS AN ENERGY STAR LABELED HOME?

An ENERGY STAR labeled home is at least 30% more energy efficient in its heating, cooling and water heating than a comparable home built to the Model Energy Code (MEC). This increased level of energy efficiency can be met using standard technologies and manufacturing practices, by successfully integrating three key home components:

- Energy efficient building envelope (effective insulation, tight construction, advanced windows)
- Energy efficient air distribution (tight, well-insulated ducts)
- Energy efficient equipment (heating, cooling and hot water)

WHY MODULAR HOME MANUFACTURERS SHOULD PARTICIPATE IN ENERGY STAR?

There are at least four basic reasons why a modular manufacturer should consider making the commitment to producing ENERGY STAR labeled homes.

1. The ENERGY STAR label can be a powerful sales tool. ENERGY STAR is a nationally recognized brand backed and promoted by two federal agencies. Affiliating with this brand is a 'badge of honor' distinguishing truly energy efficient homes.

2. The ENERGY STAR label brings a reputation for high-performance homes that can help mitigate any negative perceptions about modular homes quality. Now modular home manufacturers can get credit for quality construction advantages possible with factory-built homes.

3. ENERGY STAR verification procedures add additional quality control procedures (i.e., checklists and inspections) to the builder installation process. This helps each plant provide a more consistent product to their buyers.

4. ENERGY STAR is better for business because performance and cost advantages can only help improve customer satisfaction while increasing revenues and profits.

HOW CAN A MODULAR PLANT PARTICIPATE IN ENERGY STAR?

Becoming an active ENERGY STAR Partner involves the following steps:

1. **Plant Production (Chapter 1)**
   Each modular plant becomes an ENERGY STAR partner, chooses a set of energy measures that comply with ENERGY STAR, and than makes any necessary modifications to the plant to accommodate those measures. When this is done, the plant can begin production of ENERGY STAR – ready labeled homes.

2. **Verification Solutions (Chapter 2)**
   All ENERGY STAR labeled homes must be verified by a third-party. Securing a preferred verification solution is a critical step in becoming a successful ENERGY STAR partner. Several options and sources of verification services are available.

3. **Field Installation (Chapter 3)**
   Responsibilities for completing field installed measures depend on how each modular plant works with its builders (e.g., who does the set). Each modular plant will need to coordinate field installation procedures with their builders and be actively involved in completing the verification process.

4. **Marketing Solutions (Chapter 4)**
   ENERGY STAR is a powerful marketing tool, but you give it away if you don't tell the story. EPA provides a number of tools to help begin the process, but it will be up to each manufacturer to integrate ENERGY STAR with its overall marketing efforts. The final marketing solutions then need to be coordinated with each plant's builders.

All four parts are straightforward, but require a commitment of time and resources, backed by a commitment to marketing and selling the ENERGY STAR brand.

ACCESS TO RESOURCES

Additional information for partnering with ENERGY STAR labeled homes – including marketing materials, copies of forms, logos, Builder Option Packages, and the ENERGY STAR label – is available on EPA's web site at www.energystar.gov/homes.

Additional technical information on producing and installing ENERGY STAR labeled homes is available in the "Guide to Producing ENERGY STAR Labeled Homes for Modular Manufacturers" prepared by the Hickory Consortium (contact at 978-456-6950) for the U.S. DOE Building America Program (www.eren.doe.gov/buildings/building_america/).

PLANT PRODUCTION

Producing ENERGY STAR labeled modular homes starts with becoming a partner. Then the plant has to select energy efficiency measures, make any necessary modifications to its production process, and start manufacturing homes. These four steps are described below.

STEP 1 - Submit ENERGY STAR Partnership Agreement

Getting ready to manufacture ENERGY STAR labeled homes begins with submitting an ENERGY STAR for Homes Partnership Agreement to EPA. This agreement commits partners to using the ENERGY STAR logo consistent with EPA guidelines, which in turn protects each plant's investment in ENERGY STAR.

Agreements should be submitted separately for each plant. Make sure to list ***each state served*** under ***"Major metro area served"*** so each plant is included appropriately on the ENERGY STAR web site locator map. Plants can also choose to encourage their builders to each sign a separate ENERGY STAR for Homes Partnership Agreement. Builders will need to do this to get access to the ENERGY STAR logo and be listed on the web site.

A copy of the ENERGY STAR for Homes Partnership Agreement can be found in Appendix A as well as on the EPA web site.

ENERGY STAR® PARTNERSHIP AGREEMENT:
ENERGY STAR FOR HOMES

Through this agreement you join in partnership with ENERGY STAR. Through this partnership, the ENERGY STAR name and/or labels can be used in association with qualified homes.

To be completed by authorized company representative:
(Please type or print clearly - Information to be displayed on the ENERGY STAR Web site)

Organization Name:
Address:
City/State/Zip:
Telephone: Fax:
E-mail: Web site:
Major metro area served (for listing on our Web site):
What organization referred you to ENERGY STAR?

Partner Type:
For Home Builders (please specify):
➢ Site-built Home Builder:
○ Local Builder/Developer ○ Division/Subsidiary ○ Corporate (National)
➢ Manufactured Home Builder:
○ Plant* ○ Retailer/Community ○ Corporate (HQ/Division)
* Provide a list with name, city, state, phone # of any retailer/community you wish to be affiliated with on our Web site.
➢ System Building (e.g., modular, SIP, ICF, panel, etc.) Specify system type:
○ Plant* ○ Retailer/Local Builder ○ Corporate (HQ/Division)
* Provide a list with name, city, state, phone # of any retailer/local builder you wish to be affiliated with on our Web site.

- Parent company, if applicable:
- Average number of homes built per year:
- **100% Commitment Option.** Builders interested in special recognition can commit to building and labeling 100% of their homes with the ENERGY STAR label. This commitment will be denoted with a special 100% icon on the ENERGY STAR for Homes Web site locator map. To make this commitment please initial here:

For Verification Organizations (please specify):
○ Accredited HERS/BOP Provider ○ Certified HERS Rater/BOP Inspector
- If a Rater or Inspector, please name the Accredited Provider with whom you are affiliated:

Authorized Company Representative (printed name):
Title:
Signature: Date:

To be completed by US EPA:
Kathleen Hogan; Director, Climate Protection Partnerships Division, U.S. Environmental Protection Agency
Signature: Date:

Please mail or fax this form to:
ENERGY STAR FOR HOMES
PARTNER SUPPORT COORDINATOR
US EPA (MAIL CODE 6202J)
1200 PENNSYLVANIA AVE, NW
WASHINGTON, DC 20460
FAX: 202-565-2079
Visit www.energystar.gov/homes for additional information.
ENERGY STAR Hotline:
1-888-STAR-YES
(1-888-782-7937)

STEP 2 - Select an ENERGY STAR Specification

The purpose of this step is to select energy measures that assure homes produced by plant are ***ready*** to meet ENERGY STAR guidelines. The word "ready" is used because typically a number of energy efficiency measures have to be installed in the field. There are two ways to select energy measures. First, a Home Energy Rater System (HERS) rater can develop customized recommendations – either for each model or the entire plant. Second, EPA provides a wide range of prescriptive energy efficiency specifications called Builder Option Packages (BOPs). They are available on the EPA web site (www.energystar.gov/homes/bops) configured for each climate zone used by the national building code - International Energy Conservation Code (IECC). Given the broad geographic areas served by modular plants, manufacturers should first compile the best-matched BOPs for all relevant climate zones. A single specification for each plant can then be developed by selecting a set of energy measures that meet or exceed the requirements across all relevant climate zone BOPs. Thus, BOPs can make it easy for modular home manufacturers to insure each plant produces homes that are ENERGY STAR-ready. Plants can develop their own ENERGY STAR specifications or use the services of a BOP provider (typically a HERS rater or energy consultant) to assist in this process. Appendix B provides a more detailed explanation of how BOPs work and can be used to develop a plant specification.

STEP 3 - Incorporate ENERGY STAR Specification in Production Process

Whether using custom HERS analyses or BOPs, the plant production process must accommodate a number of energy measures to meet ENERGY STAR. These include:

- Required levels of insulation in the walls and ceiling (R-value)
- Window area within allowable limits and type (U-value/Solar Heat Gain Coefficient)
- Factory installed envelope sealing details (e.g., marriage joint gaskets)
- Sealed and insulated ducts where installed in the plant (This is typically the single biggest modification for plants doing this work. It entails a number of proven techniques and sealing systems.)

For information about incorporating all these energy measures, see the "Guide to Producing ENERGY STAR Labeled Homes for Modular Manufacturers" prepared by the Hickory Consortium for the U.S. DOE Building America Program.

If a plant already complies with one or more BOPs, no modifications are necessary. If a plant doesn't comply with any BOPs, use internal staff or hire energy consultants to determine the best energy measures to include and how to integrate them with the production process. This also includes incorporating production solutions that can assure success of builders in the field (e.g., factory installed gaskets and equipping shipped homes with preferred foam sealant for sealing marriage joints). Ultimately, all modifications need to be fully integrated in factory quality control systems including DAPIA-approved packages, plant checklists, and training programs.

STEP 4 - Produce Homes to ENERGY STAR Specification

Once DAPIA packages and plant quality control systems (e.g., checklists and training programs) are modified to include all new energy efficiency measures and procedures, IPIA inspections will automatically include quality control for ENERGY STAR and employees (existing and new) can be expected to consistently install specified measures. At this point, the plant can begin producing ENERGY STAR–ready homes that will earn the ENERGY STAR label where necessary field required measures are installed (see Chapter 3) and third-party verification is completed (see Chapter 2).

VERIFICATION SOLUTIONS

A critical area for insuring a successful ENERGY STAR partnership is securing third-party technical verification solutions for builders. This procedure can help extend plant quality assurance processes to the field.

ENERGY STAR Verification Requirements

All ENERGY STAR homes are third-party verified to use at least 30 percent less energy than a comparable home built to the MEC. Third-party verifiers can be either a HERS rater or BOP provider.

Verification Options

A HERS rater can implement either a custom HERS rating or a BOP. A BOP provider only implements BOPs. The only difference between these two verification options is how required energy measures are selected. HERS ratings are customized for one or more plans, and BOPs are prescriptive measures that insure compliance with ENERGY STAR for large geographic regions.

Once ENERGY STAR measures are identified, than both verification options require field inspection and testing to insure all measures were installed and air and duct leakage requirements are met. This field verification can be done on each individual home, or with a random sampling protocol (minimum 15% of homes – see Appendix C). However, if the sampling protocol is used, builders must be large production builders (minimum 85 homes per year) or the plant must document how they are assuring consistent field installation practices for air sealing and tight ducts among their small builders. Options for demonstrating this quality assurance include:

- Plant installed ducts and gaskets;
- Detailed prescriptive requirements and field checklists; and
- Manufacturer owned retail centers using trained HVAC subcontractors.

Sources of Verification Support/Services

Across the country, many different groups provide verification solutions including:

- ***HERS/BOP Providers*** (see locator map on ENERGY STAR web site)
  These fee-for-service professionals are the most traditional source of ENERGY STAR labeled home verification services.
- ***Utilities*** (see locator map on ENERGY STAR web site)
  Over 50 utilities partner with ENERGY STAR labeled homes, some providing free verification services along with other marketing support and financial incentives.

- ***State Administrators*** (see locator map on ENERGY STAR web site)
  State programs such as those in New York (NYSERDA) and Wisconsin (WECC) can provide free verification services along with marketing support and financial incentives.

- ***Manufacturer/Vendor Programs***
  A number of insulation manufacturers/vendors provide verification as part of their product offering (i.e., Certainteed, Green Fiber, Johns Manville, and Masco).

- ***Modular Manufacturers Become Accredited BOP Providers***
  Modular home manufacturers can choose to take charge of the verification process by becoming an accredited BOP or HERS Provider. They have this option because manufacturers are not the builders of record, and thus represent a "third-party". This could entail taking on full responsibility for testing and inspection with plant staff, or simply subcontracting inspections and testing to qualified trained technicians. Manufacturers choosing this option would have to submit a simple application to the Residential Energy Services Network (RESNET) for approval. The applications and requirements are posted on the RESNET web site (www.natresnet.org).

Coordination with Builders

Most modular home builders are often small operations with minimal resources to take on new procedures such as HERS ratings and BOP inspections. Thus, a successful ENERGY STAR partnership typically requires initiative by each plant to facilitate one or more verification options for their builders. Possible actions range from a simple handout linking builders to the most appropriate source(s) of verification to a full turn-key verification service arranged by the plant. Since each modular manufacturer's name is on every home, it is in their business interest to coordinate completion of this verification process. It insures that each home comes with a government-backed label for achieving an exemplary level of energy efficiency. This helps build a reputation for providing high-performance homes both for the company and the modular industry.

FIELD INSTALLATION

Although most energy measures are installed in the plant, a number remain to be installed in the field along with completion of the ENERGY STAR verification process. This helps extend plant quality assurance processes to the final product.

Field installation of ENERGY STAR labeled modular homes involves setting the plant-made units on foundations and completing finish details such as basement insulation, heating/cooling systems and water heating equipment. For best practices on these field installation requirements, see the "Guide to Producing ENERGY STAR Labeled Homes for Modular Manufacturers" prepared by the Hickory Consortium for the U.S. DOE Building America Program. Modular home companies will need to insure their builders are properly trained to complete field installation and verification responsibilities.

Set Details

If the plant is responsible for setting the modules, it is also responsible for tight construction details. If the builder is responsible for the set, the plant needs to insure set crews and builders are following through on required sealing details. Set details include:

- Modular units sealed to foundation (foam gaskets and/or sealant)
- Modular units sealed to each other (preferably with factory installed gaskets and foam sealant)

Finish Details

The builder is usually responsible for the finish details including:

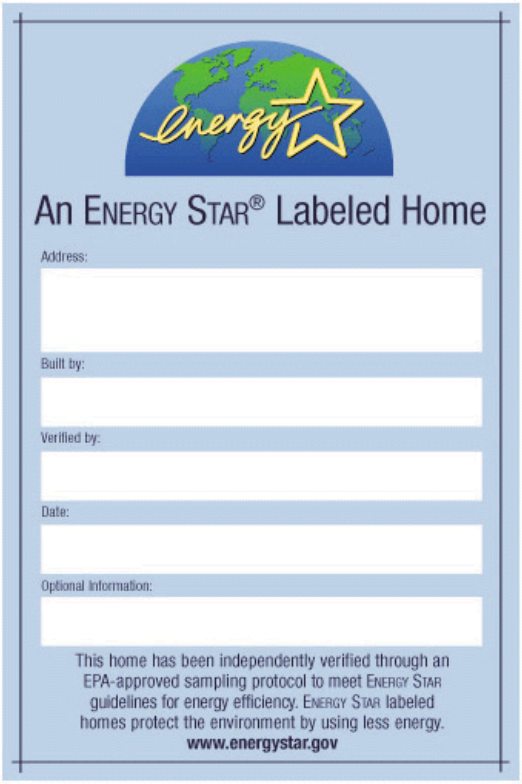
- Foundation insulation (either slab perimeter, crawl or basement walls or ceiling)
- Heating plant (required AFUE furnace or boiler or HSPF heat pump)
- Air conditioning (required SEER)
- Water heater (required Energy Factor)
- Duct sealing and insulation where outside conditioned space (required R-value air-tightness)

Complete ENERGY STAR Verification

Completed BOP checklists or HERS ratings are needed to document the installation of all energy measures. Regardless of which verification method is used, field inspection and testing (air infiltration and duct leakage) are typically required. An exception would be duct systems inside conditioned space do not need to be tested. Note that field inspectors will not be able to observe the wall insulation since modules typically arrive pre-finished. Therefore, field inspectors have to rely on the plant IPIA inspection process for this measure.

ENERGY STAR Label

Once field verification is successfully completed, the BOP inspector or HERS rater can provide the plant with ENERGY STAR sticker labels (sample shown to the right). This makes the plant and builder responsible for getting stickers placed on each home. Alternately, modular manufacturers can elect to have the BOP inspector or HERS rater place sticker labels directly on homes in the field after they successfully complete the verification process. The sticker label is most often located on the electric panel or next to the manufacturer's label (e.g., under the kitchen sink cabinet).



The BOP inspector or HERS rater can also provide ENERGY STAR certificates where requested in addition to, ***not instead of***, sticker labels. Manufacturers can include these ENERGY STAR certificates with owners' packages they might provide.

BOP inspectors or the HERS raters will then insure that these homes are reported back to EPA so manufacturers and builders gets credit for their accomplishments on EPA's ENERGY STAR web site.

MARKETING SOLUTIONS

Marketing is telling your story, and ENERGY STAR is a great story – better performing homes that cost less to own. Unless you tell your story, you give it away. EPA provides a number of tools to help, but modular plants will need to implement their own marketing solutions.

Marketing Message: Better Performance at Less Cost

Better performance for less cost sounds too good to be true, but that's what home buyers get with energy efficient homes. Tight construction, better insulation, advanced windows, and efficient equipment work together to:

- lower utility bills;
- insure even temperatures in all rooms without annoying drafts;
- provide quieter living environments;
- improve indoor air quality with better humidity control and less pollutant pathways; and
- reduce maintenance cost with less risk of mold and dry rot and longer-lived equipment.

In short, unless you're prepared to break the laws of physics, energy efficient homes have to perform better. And this performance advantage costs less because monthly utility bill savings can easily exceed small increases in the monthly mortgage attributed to the added energy efficiency measures (see example to right). Since energy efficient homes use less energy, they also protect the environment by reducing air pollution produced at power plants and home heating equipment. So, energy efficiency is a great story, and the ENERGY STAR label makes it easy to demonstrate your homes are truly energy efficient.

Why Energy Efficient Homes
Pay You Money!

Energy Eff. Home	Monthly	Annual
Utility Savings	$40	$480
Additional Mortgage Costs	$15	$180
Net Income	$25	$300

EPA Marketing Resources

As an ENERGY STAR Partner, you have access to a number of marketing resources provided by EPA. These include:

- ***The ENERGY STAR Logo***
  The logo is a widely recognized government-backed label for energy efficiency. There are no multiple performance gradients or detailed technical concepts that have to be explained. It's simply demonstrates you provide a truly energy efficient home.
- ***The ENERGY STAR Web Site***
  The web site (www.energystar.gov/homes) promotes ENERGY STAR as a compelling choice for home buyers. In addition, partners are automatically listed on a locator map for each state noted on their Partnership Agreement. These listings also include the number of homes labeled so partners get full credit for their accomplishments. EPA marketing material and messages consistently drive consumers to this web site.

- ***Consumer Materials***
  Builders can order or directly download off the web site a wide range of consumer materials that tell the ENERGY STAR story. These include brochures and stand-up display, technology fact sheets, and cash-flow software (called HomeCalc) that can be used to calculate the cost advantage for each buyer and/or model.
- **ENERGY STAR *Financing***
  Every ENERGY STAR labeled home qualifies for preferred mortgages offered by ENERGY STAR Financing Partners. Benefits range from discounts off closing costs to free ratings. See locator map on ENERGY STAR web site for a full list of financing partners and offerings.

Modular Home Manufacturer Marketing Options

The EPA resources are a good start, but it will be up to each modular home manufacturer to effectively integrate ENERGY STAR in their marketing strategy. Manufacturers are encouraged to set up a meeting with an ENERGY STAR representative to develop a customized marketing/sales action plan (see ENERGY STAR web site for a full list of Regional Account Managers). Typical marketing options for modular home manufacturers include:

- ***ENERGY STAR on Marketing Materials***
  Companies should integrate the ENERGY STAR story in their company web site, corporate brochure, advertising and other marketing material.
- ***ENERGY STAR in Display Model(s)***
  Many manufacturers encourage prospective customers to visit their plants for tours and to see one or more finished models at the plant or other locations. ENERGY STAR should be prominently featured in these models.
- ***Technology Displays***
  Energy measures utilized to meet ENERGY STAR requirements are not visible to your prospective customers in your finished homes. However, they can be effectively displayed to demonstrate each plant's attention to detail and quality. For instance, displays have been developed to show-off the performance and quality advantages of low-E windows, tight ducts, advanced insulation, high-efficiency equipment, and ventilation systems. In addition, monthly cash-flow advantages can easily be shown on charts and fact sheets.
- ***Signage***
  Research consistently shows that signage is one of the most important sources of information for new home buyers. Manufacturers should consider options for showcasing ENERGY STAR on signage both at the plant and construction sites.

Coordinate Marketing Solutions with Builders

Modular home companies need to coordinate marketing solutions with their builders including how ENERGY STAR is being featured at model homes, company marketing materials, company web site, marketing spiffs, point-of-purchase displays, and signage. In addition, Modular home companies need to assist builders in developing their own ENERGY STAR marketing materials. If builders are convened at a single venue, an ENERGY STAR representative may be available for training support. If your builders don't help you tell your ENERGY STAR story, you give it away!

APPENDIX A

PARTNERSHIP AGREEMENT

The ENERGY STAR for Homes Partnership Agreement shown here is available electronically on the web at: www.energystar.gov/homes.

ENERGY STAR *is a broad partnership designed to promote products, buildings, and homes that use less energy without sacrificing quality.*

ENERGY STAR FOR HOMES *seeks to demonstrate that energy-efficient homes can improve builder profitability, improve home quality and homeowner comfort, lower energy demand, and reduce air pollution.*

ENERGY STAR labeled homes *use at least 30 percent less energy than the reference house defined in the National Association of State Energy Officials' (NASEO) Home Energy Rating System Technical Guidelines. A home built to these levels would achieve a minimum Home Energy Rating System (HERS) score of 86.*

To receive an ENERGY STAR label, homes must be verified by an accredited, independent third party and shown to meet the performance threshold specified above. Visit ***www.energystar.gov/homes*** *for more information.*

Please mail or fax this form to:

ENERGY STAR FOR HOMES
PARTNER SUPPORT COORDINATOR
US EPA (MAIL CODE 6202J)
1200 PENNSYLVANIA AVE, NW
WASHINGTON, DC 20460

FAX: 202-565-2079

Visit www.energystar.gov/homes for additional information.

ENERGY STAR Hotline:
1-888-STAR-YES
(1-888-782-7937)

ENERGY STAR® PARTNERSHIP AGREEMENT:

ENERGY STAR FOR HOMES

Through this agreement you join in partnership with ENERGY STAR. Through this partnership, the ENERGY STAR name and/or labels can be used in association with qualified homes.

To be completed by authorized company representative:

(Please type or print clearly - Information to be displayed on the ENERGY STAR Web site)

Organization Name: _____

Address: _____

City/State/Zip: _____

Telephone: _____ Fax: _____

E-mail: _____ Web site: _____

Major metro area served (for listing on our Web site): _____

What organization referred you to ENERGY STAR? _____

Partner Type:

For Home Builders (please specify):

- Site-built Home Builder:
  - ◯ Local Builder/Developer ◯ Division/Subsidiary ◯ Corporate (National)
- Manufactured Home Builder:
  - ◯ Plant* ◯ Retailer/Community ◯ Corporate (HQ/Division)
  - * Provide a list with name, city, state, phone # of any retailer/community you wish to be affiliated with on our Web site.
- System Building (e.g., modular, SIP, ICF, panel, etc.) Specify system type: _____
  - ◯ Plant* ◯ Retailer/Local Builder ◯ Corporate (HQ/Division)
  - * Provide a list with name, city, state, phone # of any retailer/local builder you wish to be affiliated with on our Web site.

- Parent company, if applicable: _____
- Average number of homes built per year: _____
- **100% Commitment Option.** Builders interested in special recognition can commit to building and labeling 100% of their homes with the ENERGY STAR label. This commitment will be denoted with a special 100% icon on the ENERGY STAR for Homes Web site locator map. To make this commitment please initial here: _____

For Verification Organizations (please specify):

◯ Accredited HERS/BOP Provider ◯ Certified HERS Rater/BOP Inspector

- If a Rater or Inspector, please name the Accredited Provider with whom you are affiliated:

_____

Authorized Company Representative (printed name): _____

Title: _____

Signature: _____ *Date:* _____

To be completed by US EPA:

Kathleen Hogan; Director, Climate Protection Partnerships Division, U.S. Environmental Protection Agency

Signature: _____ *Date:* _____

Money Isn't All You're Saving

The ENERGY STAR labeled home performance target can be met through any combination of:

- *Envelope upgrades;*
- *Controlled air infiltration;*
- *Upgraded heating and air conditioning systems' and*
- *Upgraded water heating equipment.*

EPA encourages builder Partners to protect the health of occupants by equipping ENERGY STAR labeled homes with features that will improve indoor air quality. Additional information can be found on the ENERGY STAR Web site.

ENERGY STAR builder Partners are encouraged to equip ENERGY STAR labeled homes with energy-efficient lighting and appliances or to offer such equipment as upgrades. Additional information, including a list of labeled products, can be found on the ENERGY STAR Web site.

Visit www.energystar.gov/homes for additional information.

ENERGY STAR® PARTNERSHIP AGREEMENT:

ENERGY STAR FOR HOMES

ENERGY STAR Commitments to Partners

1. Increase awareness of the ENERGY STAR label by distributing key messages on the benefits of ENERGY STAR qualified homes and homes-related products.
2. Provide (via the ENERGY STAR Web site, Hotline, e-mail or other means) current ENERGY STAR news, information, and reference documents.
3. Provide ENERGY STAR Partners with public recognition through the Internet (in accordance with the *ENERGY STAR Web Linking Guidelines*), special awards, and media campaigns for their efforts in ENERGY STAR and role in protecting the environment.
4. Respond expediently to any Partner requests for information or clarification on ENERGY STAR policies.

General Commitments for ENERGY STAR Partners

1. Label at least one qualified home with the ENERGY STAR label within any ongoing 12-month period. Partners not fulfilling this requirement will be placed on 'Inactive' status, thereby forfeiting all rights to: the ENERGY STAR name, logo, and other materials; eligibility for ENERGY STAR awards; and inclusion on lists of ENERGY STAR Partners used on the ENERGY STAR Web site and in advertising materials. Partners placed on 'Inactive' status can be reinstated and regain all benefits by labeling a qualified home with the ENERGY STAR label.
2. Use the Partnership and the ENERGY STAR label to promote energy efficiency as an easy and desirable option for new home buyers to prevent pollution, protect the environment, and save on energy bills.
3. Build and maintain the meaning of ENERGY STAR as a trustworthy symbol that makes it easy to make a difference for the environment while saving money.
4. Adhere to the *ENERGY STAR Logo Use Guidelines* (available at www.energystar.gov/logos) and ensure that authorized representatives, such as advertising agencies, distributors, and subcontractors, also comply.
5. Adhere to the *ENERGY STAR Web Linking Guidelines* (available at www.energystar.gov/partners). Failure to do so can result in the loss of linking privileges from the ENERGY STAR Web site.
6. For accredited HERS or BOP providers, certified rater or BOP inspectors, and certified manufactured home plants, provide an ENERGY STAR label for each ENERGY STAR qualified home.
7. For accredited HERS or BOP providers and certified manufactured home plants, submit quarterly reports to ENERGY STAR specifying the number of homes verified as meeting ENERGY STAR performance specifications, listed by builder name (for providers) or by retailer (for manufacturing plants).
8. For manufactured home partners electing to manage the distribution of ENERGY STAR labeling materials at the corporate headquarters, divisional, or regional level, provide labeling materials only to qualified plants and coordinate the reporting and recordkeeping processes for each plant as described in *ENERGY STAR Labeled Manufactured Homes: Design, Manufacturing, Installation and Certification Procedures* (available at www.energystar.gov/homes).

General Terms and Disclaimers

1. Partner will not construe, claim, or imply that its participation in ENERGY STAR constitutes federal government approval, acceptance, or endorsement of anything other than the Partner's commitment to ENERGY STAR. Partnership does not constitute federal government endorsement of the Partner or its homes or services.
2. Partner understands that the activities it undertakes in connection with ENERGY STAR are voluntary and not intended to provide services to the federal government. As such, the Partner will not submit a claim for compensation to any federal agency.
3. Partner and ENERGY STAR will assume good faith as a general principle for resolving conflict and will seek to resolve all matters informally, so as to preserve maximum public confidence in ENERGY STAR.
4. This agreement is voluntary and can be terminated by either party at any time or any reason, with no penalty.
5. Failure to comply with this Partnership Agreement or the *ENERGY STAR Logo Use Guidelines* can result in termination of this Agreement and authorization to use the logo marks.
6. ENERGY STAR will actively pursue actions for resolving issues of logo use noncompliance.

ENERGY STAR Logo Mark Usage Summary

This information is presented for reference only. Please refer to the *ENERGY STAR Logo Use Guidelines* for a complete explanation of the authorized usage of each logo mark.

Certification Mark
Used to label an ENERGY STAR qualified home

Partnership Mark
Used to highlight your ENERGY STAR Partnership

Promotional Mark
Used to educate the public about ENERGY STAR

Linkage Phrase Marks
Used to promote your services and products and link to ENERGY STAR

Builder Option Packages (BOPs)

HOW BOPS WORK

There are individual BOPs for each of the 19 climate zones used in the Model Energy Code and International Energy Conservation Code (IECC). All BOPs can be accessed from a 'BOP Tool' featured on the EPA web site (www.energystar.gov/homes/bops). Each BOP has three pages: an introduction; a matrix listing all the various options; and detailed notes. A sample BOP is shown below and on the next page with explanations about how each page is configured.

These are standard notes on all BOPs that provide general guidance on how to use BOPs and work with a BOP provider.

Instructions for Using ENERGY STAR® Builder Option Packages

Builder Option Packages (BOPs) are a prescriptive method for labeling new homes ENERGY STAR. BOPs specify levels and limitations for the thermal envelope (insulatior windows), HVAC and water heating equipment efficiencies for a specific climate zone. BOPs require a third-party verification, including testing the leakage of the envelope system, to ensure the requirements have been met. Follow these steps to build an ENERGY STAR labeled home using a BOP:

1. To find the BOP, visit the ENERGY STAR Web site at www.energystar.gov/homes/bops. Check the website regularly to ensure that you are using the most current availat
2. Choose the state and county where the home will be built, and open the File. Opening the BOP files requires Adobe Acrobat Reader; a free version of Adobe Acrobat R can be downloaded from www.adobe.com.
3. Identify the package (i.e., BOP Number) that you are interested in building. There may be more than one page of BOPs to choose from, depending on your location. Mal that the house you are building meets the limitations of the package. For example, if the prospective home has 16% window area, the BOP selected must meet or excee corresponding limitation - i.e., chose a BOP that allows </= 18% or 21% window area.
4. Build the home, following all the BOP specifications. For clarification on certain items please read the attached "Footnotes" section.
5. Contact a BOP provider to get your home inspected and labeled ENERGY STAR. BOP providers can be located on the Locator Map of the ENERGY STAR Web site at www.energystar.gov/homes.
6. The BOP provider will send a BOP inspector to verify the home meets or exceeds all requirements listed in the BOP. Verification of the home typically includes testing t leakage of the envelope and duct system. If the home complies with the BOP, the inspector will sign and date the BOP sheet. This sheet is then filed with the BOP Pro their records
7. For home buyers interested in an ENERGY STAR mortgage, Fannie Mae requires estimated monthly energy cost savings. For BOPs, these estimates are determined usi monthly cost savings table developed for each climate zone, such as the table below. To use this table:
   - Choose the appropriate number of stories, foundation type, and home size that most closely fits the home being built and locate the estimated monthly savings.
   - Insert the estimated monthly cost savings in the appropriate line at the bottom of the BOP sheet. Note that these estimated savings should NOT be used as basis for guaranteeing utility bills. This should only be done on a case by case basis with a qualified energy modeling tool.
   - Submit a copy of the signed BOP, which includes the estimated monthly cost savings, with your loan request forms, and indicate your interest in receiving an ENERGY

Estimated Monthly Cost Savings Table for Climate Zone 11:

Number of Stories:	Single Story									Double Story							
Foundation Type:	Slab-on-grade			Basement			Crawlspace			Slab-on-grade			Basement			Crawlspa	
Home Size (SF):	1,000	2,000	2,500	1,000	2,000	2,500	1,000	2,000	2,500	2,000	4,000	5,000	2,000	4,000	5,000	2,000	4,000
Estimated Monthly Savings:	$15	$20	$25	$15	$20	$25	$15	$20	$25	$25	$40	$45	$30	$40	$50	$30	$45

This table provides annual energy bill savings customized for each climate zone. However, the numbers should only be considered rough "ball park" estimates of the financial benefit associated with each BOP. Banks will require this savings estimate before processing an ENERGY STAR mortgage or traditional energy efficient mortgage (EEM). The specific savings number to use would be selected based on the best match to actual home size, foundation type and number of stories. Note #7 on the instructions provides more detail.

Specific information to be completed for each home by BOP inspector.

Top row indicates specifications that vary among different BOPs

Specific packages are listed across each row. Based on the package selected, the BOP provider checks the row in the left column.

Rows split in broader groups based on different levels of equipment efficiency (i.e., top group uses 90% AFUE gas furnace and lower group uses 94% gas furnace).

DRAFT Builder Option Packages for ENERGY STAR® Labeled Homes[1]

EPA

Builder Name:_____

House Address:_____ City:_____ State:_____

Climate Zone 11 [2]

BOP Selected	BOP Number	Window Requirements			Minimum Insulation Requirements[3]						Minimum Equipment Requirements[4]							
											Gas Furnace Htg / Elec Clg		Electric Htg / Electric Clg		Oil Hydronic Htg / Elec Clg		Gas Hydronic Htg / Elec Clg	
		Maximum Window Area[5]	Window U-value	Window SHGC[6]	Attic	Exterior Wall[7]	Floor Above Unheated Space	Basement Wall	Slab	Crawlspace Wall	Heat (AFUE)	Cool (SEER)	Heat (HSPF)	Cool (SEER)	Heat (AFUE)	Cool (SEER)	Heat (AFUE)	Cool (SEER)
	1	12%	<= 0.35	<= 0.35	R- 38	R- 15	R- 19	R- 10	R- 8	R- 10	90%	10	--	--	82%	10	88%	10
	2	15%	<= 0.35	<= 0.35	R- 38	R- 19	R- 19	R- 10	R- 8	R- 10	90%	10	--	--	82%	10	88%	10
	3	15%	<= 0.35	<= 0.40	R- 38	R- 21	R- 19	R- 10	R- 6	R- 10	90%	10	--	--	82%	10	88%	10
	4	15%	<= 0.50	<= 0.37	R- 38	R- 17	R- 19	R- 10	--	R- 10	90%	10	--	--	--	--	--	--
	5	15%	<= 0.45	<= 0.37	R- 30	R- 17	R- 19	R- 10	--	R- 10	90%	10	--	--	--	--	--	--
	6	18%	<= 0.35	<= 0.40	R- 30	R- 21	R- 19	R- 10	R- 8	R- 10	90%	11	--	--	82%	10	88%	11
	7	18%	<= 0.35	<= 0.40	R- 38	R-12 ICF	R- 19	R- 10	R- 8	R- 10	90%	11	--	--	82%	10	88%	11
	8	21%	<= 0.35	<= 0.35	R- 38	R- 21	R- 19	R- 10	R- 8	R- 10	90%	13	--	--	82%	10	90%	13
	9	12%	<= 0.35	<= 0.60	R- 30	R- 13	R- 19	R- 10	R- 6	R- 10	94%	10	--	--	82%	10	88%	10
	10	12%	<= 0.40	<= 0.65	R- 30	R- 17	R- 19	R- 10	R- 8	R- 10	94%	10	--	--	82%	10	88%	10
	11	12%	<= 0.35	<= 0.45	R- 30	R- 15	R- 19	R- 10	R- 6	R- 10	94%	10	--	--	82%	10	88%	10
	12	15%	<= 0.35	<= 0.35	R- 38	R- 15	R- 19	R- 10	R- 6	R- 10	94%	10	--	--	82%	10	88%	10
	13	15%	<= 0.35	<= 0.40	R- 38	R- 17	R- 19	R- 10	R- 8	R- 10	94%	10	--	--	82%	10	88%	10
	14	15%	<= 0.40	<= 0.40	R- 38	R- 21	R- 19	R- 10	R- 8	R- 10	94%	10	--	--	82%	10	88%	10
	15	18%	<= 0.35	<= 0.35	R- 38	R- 19	R- 19	R- 10	R- 6	R- 10	94%	10	--	--	82%	10	88%	10
	16	18%	<= 0.40	<= 0.45	R- 38	R- 13	R- 19	R- 10	R- 6	R- 10	--	--	2.8 COP	13 EER	84%	11	--	--
	17	21%	<= 0.35	<= 0.35	R- 38	6.5" SIP	R- 19	R- 10	R- 6	R- 10	94%	10	--	--	82%	10	90%	10
	18	21%	<= 0.35	<= 0.40	R- 38	R- 13	R- 19	R- 10	R- 6	R- 10	--	--	2.8 COP	13 EER	84%	11	--	--
	19	21%	<= 0.40	<= 0.40	R- 38	R- 19	R- 19	R- 10	R- 6	R- 10	--	--	2.8 COP	13 EER	84%	10	--	--

BOP Provider Company's Name: _____ BOP Provider's Address: _____

BOP Provider Phone number:_____ _____

BOP Inspector's Name: _____ BOP Inspection Company's Name: _____

Inspection Date:_____ Estimated Monthly Cost Savings:[13] _____

After successful field verification, BOP inspector completes all information in this sign-off box including estimated energy savings from table on previous page.

Additional specifications that apply to all BOPs listed on prior page.

Notes clarifying all requirements and conditions associated with using the BOPs

Additional Requirements for Climate Zone 11

Envelope		Equipment					Design Limitations	
Infiltration[8]	Door	Thermostat[9]	Water Heater Energy Factor[10]	Duct Leakage[11]	Duct Insulation[12]	Ventilation	Above Grade Area per Floor	Window Orientation
<= 0.35 ac/h; blower door tested	>= R-5	Programmable	>= 0.56 gas; >= 0.86 elec;	<= 6% leakage (CFM/CFM) to unconditioned spaces at 25 Pascals; field verified	Insulate ducts in unconditioned spaces to R-6	Active ventilation recommended	<= 2500 S.F.	<= 62.5% of window area can be located on the south and west

Footnotes:

1) Meeting all the requirements in a Builder Option Package (BOP) qualifies an individual home as ENERGY STAR compliant. ENERGY STAR labeled homes are designed to use at least 30% less energy than the Home Energy Rating System (HERS) Reference Home in the areas of heating, cooling, and domestic water heating. Homes that do not meet the requirements in the BOPs, should be certified by a local HERS rater. Homes built to BOP specifications must be verified by a RESNET-approved BOP provider, in accordance with the EPA/RESNET Agreement on BOPs (see www.natresnet.org/bop/agreement.htm). Additional efficiency and savings can be achieved by selecting other ENERGY STAR labeled products throughout the house (e.g., lighting, appliances). For more information, visit www.energystar.gov. Regardless of these specifications, all local codes must be followed.
2) To determine the appropriate climate zone for the building site, see the 2000 International Energy Conservation Code, Figures 302.1 (1-50).
3) Thermal requirements vary with local building codes. Ensure that insulation levels meet all relevant codes. The BOPs were developed for homes using wood framing, unless otherwise noted [i.e., insulated concrete form (ICF) or structural insulated panel (SIP)]. If metal framing is used, consult a local HERS rater to determine additional upgrades necessary to achieve similar thermal performance, such as additional insulated sheathing.
The insulation R-Value of each component (i.e., attic, exterior wall, etc.) must meet or exceed the required level designated in the BOP. The overall R-Value for components with multiple insulating levels can be determined by calculating a weighted average of the R-Values (based on the percentage of the total area each constituent covers). For example, if the attic insulation required is R-38, and 25% of the ceiling is cathedral insulated to R-19, the required R-Value for the remaining roof would be: 0.75 / [(1 / 38) - (0.25 / 19)] = 57, or R
4) Install properly sized HVAC equipment. Recommended sizing methods: size heating & cooling equipment to ACCA Manual S specifications; size ducts to Manual D specifications, both based on Manual J load calculations. Geothermal heat pump equipment is specified in the table by a heating COP and a cooling EER.
5) Maximum window area is a ratio of total window unit area to total above-grade conditioned floor area (WFA). For example, a house with total above-grade conditioned floor area of 2,000 square feet and total window area of 400 square feet has a WFA of 400/2,000 = 20%. Regardless of the maximum window area, up to 0.5% WFA may be used for windows with decorative glass (e.g., doesn't meet U-value or SHGC requirements). Likewise, a maximum of 1.0% WFA may be used for skylights. For example, a house with total above-grade conditioned floor area of 2,000 square feet may have only 10 square feet (0.5% of 2,000) of decorative glass and 20 square feet (1% of 2,000) of skylight area. All decorative glass and skylight window area counts towards the maximum window area designated in the BOPs.
6) Solar window screens may be used to meet SHGC requirements. The overall SHGC for a window unit with solar screen is determined by the following equation: [(window SHGC) x (solar screen SHGC) x (percent of area covered)] + [window SHGC x percent of area not covered]. For example, a window with a SHGC of 0.5, using a solar screen that provides 70% shading (the equivalent of 0.3 solar heat gain coefficient) and covers 60% of the window has an overall solar heat gain coefficient of [0.5 x 0.3 x 0.6] + [0.5 x 0.4] = 0.09 + 0.20 = 0.29.
7) Insulated Concrete Form (ICF) walls must include a minimum 4" concrete thickness with minimum total form insulation of R-12. An ICF wall can be substituted for all BOPs with wall insulation levels </= R-19.
A 6.5" Structural Insulated Panel (SIP) must have an overall insulation level >= R-23. A 6.5" SIP wall can be substituted for all BOPs with wall insulation levels </= R-29.
8) ASHRAE Standard 62-89 requires 0.35 ac/h of outdoor air (but not less than 15 CFM per person) to meet ventilation requirements for residential dwellings. It allows for infiltration and natural ventilation to satisfy this requirement. However, without active ventilation the actual infiltration rate could vary significantly throughout the year. To ensure consistent indoor air quality, it is recommended that homes are built to 0.20 ac/h or tighter and an active ventilation system is installed to achieve a minimum of 0.35 ac/h. To maximize savings, use a heat recovery ventilation system in cold and moderate climates, or energy recovery ventilation in hot climates.
9) Programmable thermostats used in homes with heat pumps must have "ramp-up" technology to prevent the excessive use of electric back-up heating.
10) For BOPs with Oil or Gas Hydronic equipment, domestic water heating must be provided by the space heating boiler (tankless).
11) Duct leakage is determined by: duct leakage (%) = measured leakage from portion of duct system in unconditioned space / design airflow. For example, duct leakage for a forced air system with a design airflow of 2,000 cubic feet/minute and a measured leakage to unconditioned space of 100 cubic feet/minute (CFM) is equal to 100 CFM / 2,000 CFM = 0.05, or 5%. Duct leakage tests such as the blower door subtraction method or simultaneous duct blaster and blower door testing can be used to measure duct leakage to unconditioned
12) A minimum of R-4 duct insulation is recommended for ducts in conditioned space to prevent condensation.
13) See that attached "Monthly Utility Savings" sheet to determine estimated monthly utility savings.

Notes:

a) The symbol " -- " means that the option is not available for that specific BOP.

EXAMPLE:
DEVELOPING AN ENERGY STAR SPECIFICATION FOR A SAMPLE PLANT USING BOPs

Step One: Identify Current Plant Specifications

For this example, consider a plant that builds homes with ***up to*** 15 percent window area as a percent of floor area and the following energy measures:

Ceiling R-Value:	R-38
Wall R-Value:	R-19
Window:	0.34 U-value; 0.37 SHGC
Tight Construction:	Factory installed gaskets and spray foam shipped loose

Heating/Cooling Equipment are not included in the plant, but provided by builders.

Step Two: Identify States Served by Plant and Climate Zones:

Homes are shipped to states and climate zones within those states listed below:

State	***Climate Zones***
Pennsylvania:	10 – 14
New Jersey:	10 – 13
New York:	10 – 14
Connecticut:	12 – 14
Rhode Island:	12 & 14
Massachusetts:	12 – 14
Overall:	***10 – 14***

Step Three: Identify Most Appropriate BOPs

Based on EPA approved builder option packages, BOPs have been assembled below by climate zone for the entire geographic area served by the sample plant that most closely match current specifications and 15% window area configuration.

Zone	BOP #	Ceiling R-Value	Wall R-Value	Window		Furn. or Boiler % AFUE	AC SEER
				U-Value	SHGC		
current plant specifications		R-30	R-19	0.34	0.37	builder option	bldr. option
10	10	38	15	[0.35	[0.40	90	11
11	2	38	19	[0.35	[0.35	90	10
12	2	38	19	[0.35	[0.35	90	10
13	4	38	15	[0.35	[0.50	90	10
14	4	38	15	[0.35	[0.50	90	10

(Example continued)

Step Four: Create a Plant ENERGY STAR Specification/Checklist

A sample plant ENERGY STAR specification checklist is shown below based on the most appropriate BOPs identified in Step Three for the sample plant. Note that all specifications must meet or exceed the requirements for all Climate Zones served.

CHECKLIST FOR ENERGY STAR LABEL CERTIFICATION
Climate Zones 10,11,12,13,14

The following must be verified by a field inspection:

- ☐ Basement wall insulation R-Value μ 10, installed in the field
- ☐ Furnace AFUE rating μ 90
- ☐ Air Conditioner SEER rating μ 10 (except 11 in Climate Zone 10)
- ☐ Gas Water Heater Energy Factor, EF μ 0.56
- ☐ Programmable Thermostat
- ☐ Air Changes per Hour @ 50 Pascal [7
- ☐ Duct Leakage to outside [6% of fan flow
- ☐ Duct R-value μ 6, outside conditioned space
- ☐ Window area [62% on the south and west sides

(***manufacturer name***) has installed the following energy measures in the factory:

1. R-38 batts in the ceiling
2. R-19 batts in the exterior walls
3. Windows with low E, Argon, insulating glazing resulting in U = 0.35 & SHGC = 0.40
4. Window area [15% of the floor area

Company Name

Inspector Name | Phone Number

Inspector Signature | Inspection Date

SAMPLING PROTOCOL

EPA has developed a sampling protocol for verification organizations to use when testing and inspecting homes for production builders (i.e., build a minimum of 85 homes per year). The protocol is intended for builders who have demonstrated a consistency in their specifications and production processes. The sampling protocol allows 3rd party verifiers to randomly test and inspect a minimum of 15 percent of homes from a batch of homes located within the same climate region (typically the same subdivision). It is intended to minimize production interruptions and verification costs while ensuring homes meet or exceed the criteria for labeling homes ENERGY STAR.

Sampling Protocol Guidelines

These Guidelines provide the specifications for using sampling in verifying homes meet the ENERGY STAR criteria. Two sets of guidelines are given: required procedures and best practices. While the required procedures must be followed, the best practices are given to help users successfully implement the Sampling Protocol.

ENERGY STAR Labeled Homes – Sampling Protocol Guidelines and Requirements		
Phases of Implementation	**Required Procedures**	**Best Practice**
1. Builder Qualification	• Builder signs EPA Partnership Agreement to become an ENERGY STAR Partner. • To be eligible for sampling the builder must build a minimum of 85 homes per year.	• Builder demonstrates consistency in their specifications and production processes.
2. Select the initial subdivision and the energy efficient measures needed to meet ENERGY STAR.	• Builder selects an initial subdivision and contacts a 3rd party verifier (from Locator Map on www.energystar.gov/homes.). • 3rd party verifier identifies energy efficient measures (options) needed to meet or exceed ENERGY STAR based on - HERS rating of individual plans for each model in the subdivision, ***or*** - EPA-approved Builder Option Packages (BOPs). • If custom HERS analyses are used to select energy measures, plan reviews must be based on a worst case configuration (e.g., worst orientation, all options that increase window area, and should consider options like extended family rooms, sunrooms, etc.). • Builder selects energy efficient measures based on 3rd party verifier recommendations.	• 3rd party verifier performs diagnostics on an existing model home to get a baseline for current air infiltration and duct leakage. This enables the 3rd party to identify the improvement needed in these areas. • Builder should select one set (i.e., "spec") of energy efficient measures for entire subdivision.

Phases of Implementation	Required Procedures	Best Practice
3. Builder builds first home	• This is the first of three homes that will be fully tested and inspected before the sampling protocol can be initiated.	• 3rd party verifier works with the builder and their sub-contractors, especially the HVAC contractor to identify any changes required, and trains them on the verification/inspection process: - Air sealing and duct sealing should be a strong focus - Repeat with every new subdivision, or if the builder changes subcontractors. - This training should also be repeated for new crews and on a periodic (e.g., annual) basis.
4. Initial Testing	• 3rd party verifier performs full testing and inspecting of the first 3 homes built within the first subdivision. This is required only for the first subdivision. • If any home fails to meet specifications, the initial testing phase will continue until 3 consecutive homes pass.	• 3rd party verifier should select different models for initial testing. • Recommend repeating Initial Testing step for new subdivisions, especially if there is a change in sub-contractors. • If any of the three homes fail, particularly regarding the performance of sub-contractors on air sealing and duct sealing, an extended phase-in period should be considered where every home is tested until there is consistency in the house and duct tightness.
5. Selecting Batches	• Builder identifies a batch of homes. A "Batch" is a group of homes ready for diagnostics (i.e., drywall complete, interior door jams installed, HVAC system installed, and final air sealing completed.) These homes are likely to be concurrently under construction within a block of time (e.g., month).	• The builder and 3rd party verifier should keep the batch sizes small to catch mistakes faster and enable the builder to quickly correct any systemic problems that may be found. (Any batch with even one failure must have the entire batch tested.)

Phases of Implementation	Required Procedures	Best Practice
6. Testing / Inspecting of >/= 15% of batch	• 3rd party verifier randomly selects at least 15% of homes from a batch for testing and inspecting. • Depending on the verification method, testing and inspecting includes performing a full HERS rating or a full BOP inspection.	• When selecting the homes from an available batch for testing and inspecting, the 3rd party verifier should select different models to ensure an effective sample.
7. All Tested / Inspected Homes PASS:	• If each of the tested homes within the batch PASSES then all homes with the batch PASS.	• 3rd party should address any minor problems that may have been found during testing/inspecting by facilitating root-cause analysis and remediation with the builder and/or subcontractors.
OR **8. Any Tested / Inspected Home FAILS**	• If any rated home within the identified batch fails, the entire batch fails. The root-cause of the failure must be assessed and fixed in every home in the batch. • Each home must receive full testing and inspecting to be labeled ENERGY STAR.	• During the testing and inspecting of each home in the failed batch, assess whether or not the problem is an isolated failure. • Notify the builder and/or subcontractors to ensure the cause of the failure will be corrected in the tested home, each home within the failed batch, and in all future homes. • In general, keeping batch size small will help avoid a failure from being widespread. • After a failure has been found, the sampling rate should be increased before resuming normal sampling procedures.
9. 3rd Party Verifier Reports to Labeled Homes to EPA	• 3rd party verifier will keep a record of every home within the batch – both tested and not. • 3rd party verifier or their provider will report to EPA on a quarterly basis the number of homes receiving full inspections and the remaining number of homes that were not inspected.	